Platforma „muF4NaS“: mikrofluidní platforma pro separaci a detekci neuroaktivních steroidů

Fáze vývoje technologie

Fáze 2

Výzkum proveditelnosti. Dochází k reálnému návrhu technologie a k prvotním testům v laboratoři vedoucím k upřesnění požadavků na technologii a jejích schopností.

Status IP ochrany

The IP protection plan is being prepared

Strategie pro hledání partnera

Investice, Licencování, Spolupráce

Instituce

NÁRODNÍ ÚSTAV DUŠEVNÍHO ZDRAVÍ

Národní ústav duševního zdraví

Motivace

There are no commercially available lab-on-a-chip solutions for neuroactive steroids separation/detection. However, superior start-up is promised by the long-lasting collaboration with experts on neuroactive steroids detection and separation in human blood samples, as well as “know-how” in microdialysis and neuroscience/biomedicine methods, and deep understanding of neuroactive steroids role in neuromodulation and association with various neurological diseases.

Popis

A lab-on-a-chip is a miniaturized device that combines one or several analyses, such as DNA sequencing, immunoassays, steroids levels, or many others biochemical detections. The history of lab-on-a-chip is de facto linked to the microfluidics that exploit chemical-physical properties of liquids at a microscale. Microfluidics allow the analysis and use of less volume of samples, chemicals and reagents reducing the global fees of applications. Neuroactive steroids directly modulate the neurotransmitter receptors of the central nervous system (CNS) by nongenomic pathway and thus influence the excitability of nervous tissue. They are playing important role in the brain physiology, but also correlated with a symptomatology and severity of diseases (epilepsy, schizophrenia, etc.). There is a thin line in a balance of differently polar neuroactive steroids, and a violation of this balance can serve as an important pointer into disease progression. A lab-on-a-chip solution that allows to separate and detect neuroactive steroids based on their chemical-physical properties can be applied to quickly indicate balance disruption.

Komerční využití

Lab-on-a-chip solution for the steroids separation and detection can be

later commercially used for: • validation a neuroprotective effect of neurosteroids in the fetus. • diagnostics of steroid endocrinopathies (Cushing's Disease / Cushing Disease, adrenal tumors, gonadal dysfunction, subclinical hypercortisolism, diagnostics of adrenal dysfunctions, comparison of chronological and physiological age (impact on immunity and mental abilities from the point of view of adrenal cortex function, classification of some psychiatric diseases - affective disorders, anxiety disorders, schizophrenia, reproductive disorders - (catamenial) epilepsy, epilepsy in men, complications in pregnancy - intrahepatic cholestasis, premature birth (namely, the estimation of the date of birth), diabetes, Alzheimer's disease, cancers, endometriosis, ADHD. • Last but not least, to perform timely and inexpensive quantification of disposable steroids.